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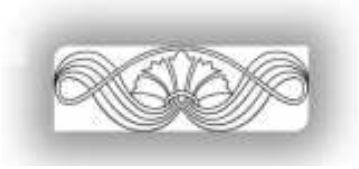
3RD INTERNATIONAL CONFERENCE ON MATHEMATICAL AND RELATED SCIENCES: CURRENT TRENDS AND DEVELOPMENTS

ONLINE MEETING, TURKEY
NOVEMBER 20-22, 2020



3RD INTERNATIONAL CONFERENCE ON MATHEMATICAL AND RELATED SCIENCES: CURRENT TRENDS AND DEVELOPMENTS

BOOK OF ABSTRACTS

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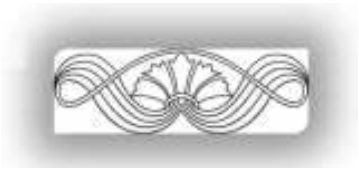

Dear Conference Participants,

Welcome to 3rd International Conference on Mathematical and Related Sciences: Current Trends and Developments.

On behalf of the Organizing Committee, I am very happy to open 3rd International Conference on Mathematical and Related Sciences. I believe that this event, which is the fruit of an intensive and devoted teamwork, will have an invaluable contribution to the scientific world. At the end of busy schedule of nearly one year, we have now achieved to organize this conference .

However, as the COVID-19 pandemic is gaining an ever tighter grip on our daily lives, as in many events, we also are forced to organize our conference as online meeting. This is because of the fact that, we, the organizers, are concerned about your health and we want to do our part to keep everyone safe. The conference is going to be held with zoom platform for participants. All presentations will be virtual presentation. We, organizing committee members, wish you all good health and high spirits. Please keep social distance and try to be realistically optimistic in these challenging coronavirus times.

The aim of the International Conference on Mathematical and Related Sciences is to bring together experts and young researchers from all over the world working in mathematics and applied mathematical sciences to present their researches, exchange new ideas, discuss challenging issues, foster future collaborations and interact with each other. In this sense, we are happy to bring together world mathematicians and exchange information with them.

The main objective of our conference is to discuss recent results in mathematics and applications and their relationship with other disciplines. We expect the participation of many prominent researchers from different countries who will present high quality papers. The conference brings together about over 100 participants from 15 countries (Turkey, Azerbaijan, Indonesia, Pakistan, Georgia, Italy, China, Croatia, Jordan, Saudi Arabia, United Arab Emirates, Uzbekistan, Nigeria, USA, Spain), out

of which 109 are contributing to the meeting with oral online presentations, including five keynote talks.

It is also a purpose of the conference to promote collaborative and networking opportunities among senior scholars and graduate students in order to advance new perspectives. The papers presented in this conference will be considered in the journals listed on the conference websites.

I'd like to express my gratitude to all our authors, members of scientific committee, keynote speakers and contributing reviewers. I believe we will see the best papers of scholars in this event. Special thanks are also due to the organizing committee members, for completing all preparations that are necessary to organize this conference. I express my gratitude to the members of technical committee of the conference for the design and proofreading of the articles.

We wish everyone a fruitful conference and pleasant memories in our online event.

Thank you.

Prof. Dr. Erhan SET

Chair of ICMRS 2020

CONTENTS

KEYNOTE SPEAKERS

ORAL ONLINE PRESENTATIONS

Control Problems for Oscillatory Systems with Liquid Dampers

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ABSTRACT

In this work the oscillatory systems with liquid dampers are considered, and for the first time an algorithm is proposed for finding the fractional-order derivative based on given static data [1]. Further, a new relation for the Mittag-Lefler function is given through the exponential functions [2], which allows to determine the stability of solutions of the linear differential equations. Also, the construction of regulators for oscillatory systems with liquid dampers is given using Larin's parameterization [3]. The results are illustrated by numerical examples.

ACKNOWLEDGEMENT

This work was supported by European Union's Horizon 2020 research and innovation programme under the Marie Sklodowska-Curie grant agreement No 873071.

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Mathematical Modeling of Infectious Diseases on Time Scales

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ABSTRACT

Studying infectious disease models helps us understanding of how the disease develops its dynamic and the risk factors, evaluating suitable treatment methods, and predicting and controling a possible outbreak.

Motivated by our earlier and current research on mathematical modeling of HIV-1 in [1], Mammary Tumors and Pseudomonas putida in [2], and SIR (susceptible-infected-recovered) in [3] and [4], the theory of time scales [5] and [6] played an important role to recover information from experimental data with varying time scales. Infectious time-scale models covers wide classes of models from continuous to discrete. In this talk, we will mainly focus on the SIS (susceptible-infected-susceptible) and SIR models and discuss the stability of the disease free and endemic equilibrium points using the linearization and Lyapunov function methods. Some interesting problems will be introduced as well.

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On Certain Qualitative Properties of Minimizers of Functionals

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ABSTRACT

In our treatmet let us consider $\Omega \subset \mathbb{R}^m$ $(m \geq 2)$ be a bounded open set. For maps $u : \Omega \to \mathbb{R}^n$ we set the $p(x)$*-energy functional* defined as follows

$$E(u;\Omega) := \int_\Omega (g^{\alpha\beta}(x) G_{ij}(u) D_\alpha u^i(x) D_\beta u^j(x))^{p(x)/2} dx, \qquad (1)$$

being $(g^{\alpha\beta}(x))$ and $(G_{ij}(u))$ symmetric positive definite matrices whose entries are continuous functions defined on Ω and $\mathbb{R}^n$ respectively, and $p(x)$ a continuous function on Ω with $p(x) \geq 2$.

Main goal is the study of qualitative results concerning interior and global regularity of the minimizers u of E.

The General Integral Form of Jensen's Inequality

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ABSTRACT

The aim of this presentation is to show the integral form of Jensen's inequality for convex functions of several variables as general as possible. In this regard, we have to rely on the decomposition of a nonempty convex set C in the n-dimensional space R^n using concepts of the relative interior of C, and k-faces of C including extreme points as 0-faces.
A nonempty convex set C in R^n can be represented as the union of pairwise disjoint relative interiors of its k-faces for those integers k between 0 and n for which k-faces exist. Such a union can be finite (tetrahedron in R^3) or infinite (cone in R^3).

ACKNOWLEDGEMENT

This work has been fully supported by Mechanical Engineering Faculty in Slavonski Brod under the internal research project Generalization of Arithmetic Means and Their Applications.

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Periods for Continuous Maps on Some Compact Spaces

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ABSTRACT

The objective of this talk is to provide information on the set of periodic points of a continuous self-map defined in the following compact spaces: S^n (the n-dimensional sphere), S^n×S^m (the product space of the n-dimensional with the m-dimensional spheres), CP^n (the n-dimensional complex projective space) and HP^n (the n-dimensional quaternion projective space). We use as main tool the action of the map on the homology groups of these compact spaces.

Renewed Concept of Neutrosophic Soft Graphs

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ABSTRACT

In this study, we give renewed concepts of neutrosophic soft graph and neutrosophic soft subgraph, and present illustrative examples. We also define union and intersection operations on neutrosophic soft graphs and derive their basic properties.

ACKNOWLEDGEMENT
This study was supported within the scope of project number B-1811 accepted by Ordu University Scientific Research Projects Commission.

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Fuzzy Implicative Ideals of Sheffer stroke BG-algebras

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ABSTRACT

In this paper, Sheffer stroke BG-algebra is given and a fuzzy ideal of Sheffer stroke BG-algebra and some properties are presented. A fuzzy implicative ideal and a fuzzy sub-implicative ideal of a Sheffer stroke BG-algebra are determined and the relationship between this structures are shown. Morever, an implicative Sheffer stroke BG-algebra and a medial Sheffer stroke BG-algebra are defined and it is proved that every medial Sheffer stroke BG-algebra is an implicative Sheffer stroke BG-algebra. Finally, a fuzzy closed ideal, a fuzzy completely closed ideal and a fuzzy p-ideal are described and the relationship between them are indicated.

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Restriction of The Pillai's Problem to Pell Numbers

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ABSTRACT

In 1936 and again in 1945, Pillai conjectured that for any given integer $s \geq 1$, the number of positive integer solutions (a, b, x, y), with $x \geq 2$ and $y \geq 2$, to the equation $a^x - b^y = s$, is finite. Aim of this research is to obtain some results by restricting the Pillai problem to Pell numbers.

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A New Bound for Jensen's Gap Pertaining Twice Differentiable Functions with Applications

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ABSTRACT

In this paper, we present a new bound for Jensen's gap by using a Green function. Utilizing the bound, we derive a new variant of the Hölder inequality as well. Finally, we present some applications of the main result in information theory.

Differential *LG*-Game of Many Pursuers and One Evader

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ABSTRACT

In this abstract, we have been studied differential game of many pursuers and one evader in the case when linear constraints are imposed on the pursuers' control class and only a geometrical constraint is imposed on the evader's control class. The main purpose of this work is to construct the optimal strategies of pursuers and to find the pursuit time.

Consider the differential game when Pursuers X_i, $i=1,2,...,m$ and Evader Y having radius vectors x_i and y correspondingly move in the space R^n. If their velocity vectors are u_i and v, then the game will be described by equations: $\dot{x}_i = u_i$, $x_i(0) = x_{i0}$ (1) and $\dot{y} = v$, $y(0) = y_0$ (2); where $x_i, y, u_i, v \in R^n$, $n \geq 1$; and $x_i(0) = x_{i0}$ and $y(0) = y_0$ are the initial positions of the objects X_i and Y. Here the control functions u_i satisfy a linear constraint $\int_0^t |u_i(s)|^2 ds \leq L_i(t)$, $t \geq 0$ (3); where $L_i(t) = \rho_{i1}t + \rho_{i0}$. From the physical point of view, the right-hand of inequality (3) corresponds to the liner change of the given resource depending on the time $t \geq 0$. Therefore, the linear function $L_i(t)$ can be called the current change of the given resource of the Pursuers X_i. Clearly, this resource increases if $\rho_{i1} > 0$, decreases if $\rho_{i1} > 0$ and remains unchanged if $\rho_{i1} = 0$. In the last case, constraint (3) is an Integral constraint. If $\rho_{i1} > 0$ and $\rho_{i0} = 0$, then constraint (3) can be called a Geometrical constraint. The control function v satisfies a geometrical constraint $|v(t)| \leq \beta$, for almost every $t \geq 0$ (4). In the $LG-$game (1)-(4), the objective for at least one of the Pursuers X_i is to catch the Evader Y, i.e., to reach the equality $x_i(t) = y(t)$. The Evader Y tries to avoid meeting, and if it is impossible, to postpone the moment of meeting as far as possible.

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Classification Ischemic Stroke using Convolutional Neural Network and Naïve Bayes based on CT Scan Images

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ABSTRACT

Computerized tomography (CT) scanning is very important and effective for the accurate diagnosis of ischemic stroke, in addition to its lower cost, its availability is also greater than magnetic resonance imaging (MRI). This paper presents deep learning and machine learning methods for classifying ischemic strokes. Deep learning methods have produced significant improvements in neural imaging in the last decade. Convolutional Neural Networks (CNN) is known as a deep learning method that provides high image recognition accuracy but requires high computation costs and long running time. So, in this paper to overcome these shortcomings, the authors will provide an update in the classification of ischemic strokes by replacing the role of the Neural Network in CNN with Naïve Bayes. Thus, after feature extraction by CNN, the fully connected layer step in CNN is replaced to Naïve Bayes. Based on the proposed method, the testing accuracy is 94% and it even takes less than 8 seconds to pass the dataset to the CNN model and 40 ± 0.5 seconds to be classified in Naïve Bayes. Therefore, it is evident that our proposed method has an effective, efficient and promising performance for classifying ischemic strokes from CT scan images.

ACKNOWLEDGEMENT
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Comparing Some Kernels of Support Vector Machines for Acute Sinusitis Classification

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ABSTRACT

Sinusitis is an inflammatory condition of the paranasal sinuses, which according to its onset is further classified into acute, sub – acute, chronic, and recurrent. Antibiotics are usually prescribed to treat patients with acute sinusitis. However, due to concerns and guidelines regarding the use of antibiotics, it is essential to determine an accurate diagnosis on acute sinusitis. Therefore, adequate diagnosis is needed to prevent acute sinusitis become worse and obtain the best treatment. This research studied the use of an improved machine learning process for the appropriate diagnosis of acute sinusitis. The purpose was to compare some kernel functions with Support Vector Machines classifier for proper diagnosis. To measure the most accurate kernel function, the Support Vector Machines classifier with linear, polynomial, and Gaussian radial basis functions were applied as the commonly used kernels. The main advantage of this method is determining the best kernel function to support the healthcare sector in diagnosing acute sinusitis with Support Vector Machines. The idea is proven in four criteria, namely accuracy, precision, recall, and F1 score. The highest average of accuracy and F1 score were the criterion used to determine the best kernel function classification. The result showed that linear kernel function is the best for acute sinusitis classification with 99.37% average of accuracy, followed by a polynomial and Gaussian radial basis. In addition, all three kernels reached 100% accuracy, with different precision, recall, and F1 score of the training data and future studies need to be carried out to improve machines learning classification for medical diagnosis with kernel function contribution.

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Comparison of Several Kernel Functions on Neural Network-Support Vector Machine as Classifier for Lung Cancer

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ABSTRACT

Lung cancer is one of the three most common types of cancer in Indonesia that a condition delineates by unbridled cell accretion in the lung tissue. There are several causes of lung cancer, such as ranging from diets high in fat, pollution, to genetics. In the early stages, lung cancer indications are not perceptible; however, it is easily detected with different forms of machine learning methods, such as the Neural Network (NN). This is a popular method with a wide range of applications and known for its high accuracy value, which is a computation system where architecture and computation are inspired by knowledge of nerve cells in the brain. Moreover, there is a Support Vector Machine (SVM) with several kernel functions that is commonly used in the classification of diseases and also known for its high accuracy value that has a more mature with clearer mathematical concept compared to other classification techniques. This research received database of Lung Cancer sufferers from Dr. Cipto Mangunkusumo Hospital, Indonesia, and it consisted of 138 data with actual amounts of 69 major and 69 minor data. Therefore, the combination of NN–SVM with several kernel functions as classifier for the lung cancer dataset will be compared. Based on results, Neural Network–Support Vector Machine with Gaussian RBF Kernel is the best model for the classification of Lung Cancer with 97.94% accuracy. Hopefully, in the future research, this method develops to give higher accuracy and uses a larger database, in order to give better results for predicting and classifying different diseases.

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Classification of Small Lung Cancer Data with Artificial Neural Network and Support Vector Machine

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ABSTRACT

Lung cancer is the second most common form of cancer and the most frequent cause of related deaths worldwide. As part of the respiratory system, the lungs are the main organs for breathing. Early detection of lung cancer is required for the provision of further care and to improve survival rate. Therefore, it is essential to adopt more advanced technology. Nowadays, machine learning is an advanced technology used to carry out the classification task by learning historical data and finding the pattern. In previous papers, numerous machine learning methods have been proposed to help medical staff easily classify lung cancer. The two methods used in this study were Artificial Neural Network (ANN) and Support Vector Machine (SVM). The idea of ANN is using connected neurons arranged into a layered structure to learn from data training and make a prediction in data testing. Meanwhile, SVM idea is mapping the input space to a higher dimensional space. In classification task, to separate data into classes SVM constructed a hyperplane. The authors made a comparison between ANN and SVM to classify Lung Cancer from CT (computed tomography) scan images presented with a small number of datasets. The data used was obtained from Cipto Mangunkusumo Hospital, Jakarta, Indonesia. Based on experiments carried out, the results showed that Lung Cancer small data classification using Artificial Neural Network and Support Vector Machine had 96% and 90% accuracy, respectively.

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On SA4 Multiwavelet Construction with Improved Accuracy

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ABSTRACT

Matrix spectral factorization frequently plays a key role in construction of certain wavelets and multiwavelets. SA4 is an important multiwavelet which has a potential to be used in image processing [3]. An accurate approximation to its filter coefficients is crucial for successful applications of the multiwavelet. A matrix polynomial P which has to be factorized in order to obtain SA4 is singular and has 8-th order zero on the boundary. However, the determinant of this matrix can be written explicitly.

Janashia-Lagvilava algorithm is a relatively new method of matrix spectral factorization [1], [2], which reduces the complexity of matrix factorization to the scalar case. Since $\det P$ can be factorized exactly by explicitly given formula, there is no loss of accuracy in scalar spectral factorization of the singular determinant. Therefore, Janashia-Lagvilava method achieves the approximation to the exact result within the MatLab round-off accuracy. Particularly, this accuracy is preserved when computations are performed with Multiprecision Computing Toolbox of MatLab.

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Weighted Multilinear Hardy and Rellich Inequalities

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ABSTRACT

A considerable effort has been made in recent years to establish the (weighted) mapping properties of differential and integral operators in Lebesgue spaces. Such problems have been studied extensively in Harmonic Analysis, especially in the last two decades. We establish multilinear variants of weighted Rellich inequalities on the real line. To get the main results, weighted criteria for multilinear Hardy operators are also derived. Tha talk is based on the joint work with David Edmunds.

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Weighted Inequalities for One-Sided Multilinear Integral Operators

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ABSTRACT

One weighted and two weighted norm estimates for one-sided multilinear fractional integrals are derived. One-weight estimates are derived on the based on Welland's type pointwise estimates which are also obtained. The class of integral operators which we study contains one-sided multi(sub)linear fractional maximal operators, multilinear Riemann-Liouville and Weyl integral transforms. The talk is based on the investigation carried out jointly with G. Imerlishvili.

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Trace Inequalities for Fractional Integrals in Mixed Norm Grand Lebesgue Spaces

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ABSTRACT

D. Adams type trace inequalities for multiple fractional integral operators in grand Lebesgue spaces with mixed norms are established. Operators under consideration contain multiple fractional integrals defined on the product of quasi-metric measure spaces, and one-sided multiple potentials. In the case when we deal with operators defined on bounded sets, the established conditions are simultaneously necessary and sufficient for appropriate trace inequalities. The derived results are new even for multiple Riesz potential operators defined on the product of Euclidean spaces.
The talk is based on the recent paper: V. Kokilashvili and A. Meskhi, *Fract. Calc. Appl. Anal.* Vol. 23, No 5 (2020), 1452–1471, DOI: 10.1515/fca-2020-0072.

ACKNOWLEDGEMENT

This work was supported by the Shota Rustaveli National Science Foundation Grant (No. FR-18-2499).

On the Boundedness in Generalized Weighted Grand Lebesgue Spaces of Some Integral Operators Associated to the Schrödinger Operator

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ABSTRACT

The present talk deals with the boundedness on generalized weighted grand Lebesgue spaces on R^d, $d \geq 3$ of diffusion semi-group maximal functions, Riesz transforms and their adjoints and Littlewood-Paley quadratic functions related to the Schrȍdinger differential operator $-\Delta + V$, where the potential V satisfies a reverse Hȍlder inequality with exponent greather than $d/2$. The class of weights, more general than Muchenhoupt's, is used.

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On The Convergence of Hermite Interpolation Operator At Zeros of Jacobi Polynomials of Second Kind

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ABSTRACT

In this work, we introduce the most general form of Hermite interpolation polynomial, then Hermite Interpolation operator is used for approximating a function $f(x)$ and it is derivative. We study the estimation of a function $f(x)$ and its derivative by Hermite operator $H_{2n+1}(f;x)$ based on Jacobi polynomials of second kind. We prove a sequence of Lemmas that needed to prove our main result. The main purpose of this work is to investigate the uppers bounds of error between Hermite interpolation of a differentiable function, and its origin function, where modulus of continuity based on the are involved. Some results are thought to be improvement over those in other previous results in the same aspect. It is observed that using Hermite interpolation operator is simple and efficiencies. A variety of numerical example are presented with graphical justification to show the accuracy of the proposed method.

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Subordination and Superordination of the Multiplier Transformation for Meromorphic Function

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ABSTRACT

In the paper, the authors introduce and investigate a new subclasses of meromorphic functions, which by making use of the principle of subordination between analytic functions and a family of multiplier transforms. Some subordination and superordination results associated with the multiplier transforms are proved and several sandwich-type results are also obtained.

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q-Difference Equations for The Generalized Cigler's Polynomials

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ABSTRACT

In this talk, we show how to prove several types of generating functions for Cigler's polynomials involving four variables by the method of homogeneous q-difference equations. We utilize some methods and results of Liu's [Ramanujan Math. Soc. 20 (2013), pp. 213–250.] and Fang's [Appl. Math. Comput. 248 (2014), pp. 550–561.] continue to study Cigler's results [J. Differ. Equ. Appl. 22 (2016), pp. 1880–1892.]. In addition, we deduce U(n+1) type generation functions for Cigler's polynomials. More over, we build relations between transformation formulas and homogeneous q-difference equations. And then, we gain multilinear and multiple generating functions for Cigler's polynomials as application. Finally, we generalize Andrews–Askey integrals, moment integrals and Askey–Roy integrals by the method of homogeneous q-difference equations.

Monotonicity and Complete Monotonicity of Two Functions Defined by Three Derivatives of A Function Involving Trigamma Function

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ABSTRACT

In the paper, by convolution theorem of the Laplace transforms, a monotonicity rule for the ratio of two Laplace transforms, Bernstein's theorem for completely monotonic functions, and other analytic techniques, the authors
(1) verify decreasing monotonicity of a ratio between three derivatives of a function involving trigamma function;
(2) find necessary and sufficient conditions for a function defined by three derivatives of a function involving trigamma function to be completely monotonic.
These results confirm previous guesses posed by the first author and generalize corresponding known conclusions.

Classification of Hepatocellular Carcinoma (HCC) using An Extended Three-Way C-Means Based on Kernel

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ABSTRACT

Three-way c-means based on the kernel function of classifying Hepatocellular Carcinoma (HCC) data was proposed in this paper. As the improvement version of the rough k-means, it will be integrated with the polynomial kernel function. One of the important benefits of the proposed method is its ability to handle the data that cannot be separated linearly. The method was evaluated using k-fold cross-validation with k = 3, 5, 7, 10. Its sensitivity, precision, and F1-Score were compared to the three-way c-means in classifying the HCC dataset from Al Islam Bandung Hospital Indonesia, which consists of 130 HCC and 73 non-HCC samples. The result confirms that the proposed method makes the increment up to 10 percent to the three-way c-means in sensitivity, precision, and F1-Score. Therefore, the method proposed in this paper can be used to provide a proper diagnosis because it has high sensitivity in the classification.

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An Efficient and Robust Ischemic Stroke Detection Using a Combination of Convolutional Neural Network (CNN) and Kernel K-Means Clustering

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ABSTRACT

This paper introduces the combined widely-used Convolutional Neural Network (CNN) and Kernel K-Means clustering method for ischemic stroke detection from Magnetic Resonance Imaging (MRI) image. We propose an efficient and robust alternating classification scheme for overcoming the large time computation and noisy ischemic stroke image obtained from Cipto Mangunkusumo (RSCM) Hospital, Indonesia. This method used a bunch of convolutional layers resulted from CNN architecture and then vectorize the matrix output as the new input in Kernel K-Means clustering. According to several experiments that we conducted, our proposed method achieved 99% accuracy, 100% sensitivity, 98% precision, 98.04% specificity, and 98.99% F1-Score using 11-fold cross-validation with RBF kernel function (sigma=5×10^{-2}). Therefore, our experiments show that the performance of the combination of CNN and Kernel K-Means clustering decisively competed with several other state-of-the-art methods in the deep learning field.

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Convolutional Neural Networks and Support Vector Machines Applied to CT Scan in Ischemic Stroke Detection

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ABSTRACT

Stroke is a disease that causes long-term disability and death, so it is important to be able to detect a stroke as early as possible. Stroke is divided into 2 types, namely ischemic stroke and hemorrhagic stroke, but 87% of stroke sufferers are ischemic strokes. CT scan is effective for accurate diagnosis of ischemic stroke. Technological developments in the health sector have played an important role in helping the management of ischemic stroke sufferers. In recent years, deep learning and machine learning have provided new directions for CT scan detection for ischemic stroke sufferers, due to their ability to provide highly accurate predictive results. So, the problem of long-term diagnosis that adds to doctor's fatigue and can lead to the wrong situation is no longer a worrying factor. In this paper, we build an ensemble method that helps improve the accuracy of ischemic stroke detection, we combine deep learning and machine learning. Convolutional Neural Network (CNN) is one of the methods commonly used for image classification, but in this study, we only used CNN to extract the CT scan image data into numeric, then the results of the convolution were classified with Support Vector Machines (SVM) classifier. A total of 92 CT scans were considered for this model, data obtained from the Radiology Department of the National General Hospital (RSCM) Cipto Mangunkusumo, Indonesia. The proposed method efficiently detects ischemic stroke with an accuracy of 97% using CNN as feature extraction and SVM as a classifier, wherein the proposed method can be used to assist a doctor or radiologist in the decision-making process in the treatment of ischemic stroke.

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Some New Bullen Type Inequalities for Different Kinds of Convexity on the Co-ordinates

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ABSTRACT

The main motivation of the paper is to prove some new Bullen type integral inequalities by using coordinated quasi-convex functions. We have also given some special cases for the bounded functions.

Some Hardy Type Inequalities for Convex Functions via Delta Fractional Integrals

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ABSTRACT

In the paper, it is tried to extend Jensen and Hardy inequalities including Hardy-Hilbert type inequality and Polya–Knopp type inequalities for convex functions by using Riemann-Liouville delta fractional integrals. Particular cases of obtained inequalities give us the results on time scales calculus, fractional calculus, discrete fractional calculus and quantum fractional calculus as well.

Some Fractional Integral Inequalities for Geometrically Convex Functions

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ABSTRACT

In this paper some new inequalities of Hadamard-type are established for the classes of functions whose derivatives of absolute values are geometrically m− geometrically convex functions via Riemann-Liouville integrals.

Increasing Accuracy of Measurement Using the Discrete Averaging

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ABSTRACT

This article addresses the problem of eliminating errors that occur during the processing stage, taking into account the increased demand for digital signal processing of measurement results in the oil and gas industry. We investigated the problems associated with corrective filtering and discrete averaging in digital signal processing. The proposed approach to the creation of information-measuring systems of the parameters under consideration consists of a cumulative analysis of measurement processes and corrective filtration with the aim of achieving balanced metrological, structural, algorithmic and functional indicators of the effectiveness of the developed tools. Thus, the proposed approach to improve the accuracy of measurement objectives is a comprehensive analysis of measurement processes and a corrective filter to provide a balanced assessment of the effectiveness, structural and functional efficiency of the developed algorithmic tools. Therefore, the proposed approach to improve the accuracy of measurement objectives for monitoring and diagnosis of pre-measured control parameters should be corrected using a digital averaging filter and only then based on the corrected results for monitoring and diagnosis.

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Main Aspects of the Impact of Globalization on The Development of The Digital Economy in Modern Conditions

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ABSTRACT

At the present stage of development, digitalization has become the most important factor in the economic growth of the national and global economy. We analyzed the problem according to the following scheme: first, the necessary information on the topic was collected, then the data were summarized and appropriate recommendations were developed. All available information on this issue was obtained by studying scientific works and articles, materials of scientific conferences, as well as analyzing statistical data. Thus, the process of collecting information helps to identify facts that are logically interrelated. The object of research is the digital economy in modern conditions of globalization.

The work examines the basics of the relationship between the digital economy and the current stage of globalization. The purpose of this article is to substantiate the conclusion that the development of the digital economy has caused the formation of a new stage of globalization-digital globalization. General scientific methods, a systematic approach, and economic and statistical methods were used as a research method.

The study found that digital technologies are widely used in traditional sectors of the economy and finance, and digital globalization should be seen as a driving force of global economic growth. Based on the study of best practices in promoting digitalization of the leading countries, the priorities for the formation of the digital economy in the Republic of Azerbaijan are substantiated.

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On One Problem of the Large-Scale Parametric Linear Fractional Programming

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ABSTRACT

In this work the programming problem with a set of feasible solutions defined by the condition:

$$Ix \le Ax + b, \quad x \ge o \tag{1}$$

and the objective function is expressed by a linear fractional function depending on the parameter λ, $\lambda \in [0;1]$.

$$z = \frac{(c' + \lambda c^2)x + e}{(d^1 + \lambda d^2)x + f} \to \max, \quad 0 \le \lambda \le 1. \tag{2}$$

It is required for each value of λ, $0 \le \lambda \le 1$ to find a non-negative vector x that satisfies the condition (1) and provides the maximum value to the linear fractional function (2).

In the problem statement (1), (2) x is n-dimensional column vector of unknown variables x_i, I is n order unit matrix, A is n order matrix with nonnegative elements $(A \ge 0)$, b is n dimensional column vector $(b \ge 0)$, c^1, c^2, d^1, d^2 are n dimensional row vectors, e, f are the numbers.

Methods for solving the problem (1), (2) are shown as a large-scale problem, as well as the efficiency and difference of these methods from standard previously existing ones.
Under additional conditions, the behaviour of the solution of the considered problem is investigated depending on the change of the parameter λ [1, 2].

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A NTRU Type Cryptosystem Based on Circulant Matrices

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ABSTRACT

In this study, NTRU cryptosystem is examined on circulant matrices. These matrix types have been studied due to the rapid selection of matrices that will serve as private keys. Again, using some interesting and important linear algebra properties of circulant matrices, the NTRU cryptosystem has been studied in a different and original ring. Some results obtained place the NTRU crypto system on solid foundations in algebraically.

A Study on a Graph of Modules over Commutative Rings

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ABSTRACT

Let M be a nonzero unital module over a commutative ring R with a nonzero identity. In this work, we associate a new graph $\mathfrak{C}(M)$ to a unital R-module M. We investigate some graphical properties of $\mathfrak{C}(M)$. Also, we characterize some important class of rings and modules such as torsion-free modules, torsionable modules and modules satisfying strong property T in terms of $\mathfrak{C}(M)$.

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The Hadamard-type Padovan-p Sequences Modulo *m*

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ABSTRACT

In [1], Akuzum defined the Hadamard-type Padovan-p sequence by using Hadamard-type product of characteristic polynomials of Padovan sequence and the Padovan-p sequence as shown:

$$P_{n+p+2}^{h} = P_{n+p}^{h} - P_{n+3}^{h} + P_{n+1}^{h} - P_{n}^{h}$$

for $p \geq 4$ and $n \geq 0$ with initial constants $P_0^h = P_1^h = \cdots = P_p^h = 0$ and $P_{p+1}^h = 1$. Also, she obtained miscellaneous properties of the Hadamard-type Padovan-p sequence. The study of recurrence sequences in groups began with the earlier work of Wall [2] where the ordinary Fibonacci sequences in cyclic groups were investigated. In this work, we obtain the cyclic groups which are produced by generating matrix of the Hadamard-type Padovan-p sequence when read modulo m. Also, we study the Hadamard-type Padovan-p sequence modulo m, and then we derive the relationship between the order the cyclic groups obtained and the periods of the Hadamard-type Padovan-p sequence modulo m.

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The Pell-Fibonacci Sequence in Finite Groups

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ABSTRACT

In [1], Deveci defined the Pell-Fibonacci sequence which is directly related to the Pell and Fibonacci numbers as follows:

$$P-F(n+4)=3P-F(n+3)-3P-F(n+1)-P-F(n)$$

for $n\geq 0$ with initial constants $P-F(0)=P-F(1)=P-F(2)=0, P-F(3)=1$. Also, He gave the relations between the generating matrix of the defined sequence and the elements of the Pell and Fibonacci sequences. Furthermore, using the generating matrix and the generating function of the defined sequence, he obtained structural properties of the defined sequences such as the Binet formulas, the determinantal and permanental representations which are intimately connected with Pell and Fibonacci numbers. The study of the linear recurrence sequences in groups began with the earlier work of Wall [2] where the ordinary Fibonacci sequences in cyclic groups were investigated. In this work, we extend the Pell-Fibonacci sequence to groups and we redefine the Pell-Fibonacci sequence by means of the elements of groups which is called the Pell-Fibonacci sequence orbit. Also, we consider the Dihedral groups D_{2n}, $(n\geq 2)$ and then, we give the lengths of the periods of the Pell-Fibonacci sequence orbit in the Dihedral groups D_{2n}, $(n\geq 2)$ as applications of the results obtained.

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Breast Cancer Prediction by Using of Tolerance-based Intuitionistic Fuzzy-Rough Set Feature Selection Method and Machine Learning

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ABSTRACT

The importance of diagnosing breast cancer is one of the most significant issues in medical science. Diagnosing whether the cancer is benign or malignant is extremely important in determining the type of treatment, in addition to reducing costs. This study aims to use the tolerance-based intuitionistic fuzzy-rough set method for feature selection and data mining with help of machine learning for early detection of breast cancer. The main purpose of selecting a feature is to make a subset of input variables by removing irrelevant variables or variables that lack predictive information. Rough set theory has been used successfully to set down attributes, but this theory is insufficient to reduce the properties of a real- value dataset because it may lose some knowledge during the decomposition process. By combining fuzzy and rough set theories, assorted feature selection techniques have been propounded that can easily manage real-valued data. In this paper, we have used the intuitive fuzzy method, which has a high ability to belong set compared to the classical fuzzy set in conditions of uncertainty due to having simultaneous membership degrees, non-membership, and hesitation degrees.

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Numerical Solution of Volterra-Fredholm Integral Equations Using Hosoya Polynomial

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ABSTRACT

In this paper, Volterra-Fredholm integral equation is solved. Volterra-Fredholm integral equation is solved by Hosoya Polynomials. The solutions obtained with these methods were compared on the figure and table. And error analysis was done.

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Some Exact Travelling Wave Solutions of Sixth-Order Ramani Equation and (3+1)-Dimensional Shallow Water Wave Equation (SWWE)

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ABSTRACT

In this paper, we implemented an Generalized $\left(\frac{G'}{G}\right)$ – expansion method for some exact solutions of Sixth-order Ramani equation and (3+1)-dimensional shallow water wave equation. By using this scheme, we found several exact travelling wave solutions of the sixth-order Ramani equation and (3+1)-dimensional shallow water wave equation. These solutions are both exponential function solutions and rational function solutions. In addition, graphs of some solutions and numerical explanations of these graphs were given. Recently, this method has been studied for obtaining exact travelling wave solutions of nonlinear partial differential equations.

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Static Analysis of Moderately Thick Arbitrarily Laminated Composite Cantilever Plates

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ABSTRACT

The usage of fiber-reinforced composite structures is highly demanded in the field of mechanical, civil, naval, space/aerospace, and defense industries. This is mostly due to their specific properties such as high strength-to-weight, stiffness-to-weight ratios and predominantly tailoring capacity of composites for intended usage. Cantilever plate structures may be considered geometries such as an aircraft wing structure, a balcony of a building, cantilever supports in many structures, etc. Therefore, it is important to analyze these structures made of composites and in addition to solving the problems for the anisotropic behavior of such composite materials and satisfying the specific boundary conditions create additional difficulties for the analysis of those structures. Thus, the static behavior of moderately thick arbitrarily laminated composite plate structures under the cantilever type boundary condition is examined in this study. Governing equilibrium equations of plate structures considering the first-order shear deformation theory are obtained using the virtual work principle. The displacement fields in the partial derivatives of equations are expressed by using the Lagrange polynomials. Differential quadrature method (DQM) is used to examine the effect of the parameters such as the stacking sequence of lamination and orientation angle of plate structures. Obtained results are also compared with the finite element counterparts using a commercial FEA program.

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Some New Fractional Inequalities for Quasi-Convex Functions

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ABSTRACT

In this paper, some historical backgorunds and some earlier results have been given related to quasi-convexity, Riemann Liouville fractional integral operators and general forms of proportional fractional integral operators. In the second part, some new integral inequalities have been established via the general forms of proportional fractional integral operators for integrable quasi-convex mappings.

Generalized Proportional Fractional Integral Operators and Related Inequalities

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ABSTRACT

In this paper, we have recalled some well known concepts related to fractional calculus and convexity. Then, we have proved some new integral inequalities for P −functions via generalized proportional fractional integral operators.

New Hermite-Hadamard and Ostrowski Type Integral Inequalities via n-Polynomial Harmonically s-type Convex Functions and Applications

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ABSTRACT

. In this paper, we introduce the concept of n-polynomial harmonically s-type convex function. We elaborate and investigate the new introduced concept by examples and some elegant algebraic properties. Furthermore new Hermite--Hadamard, some refinements of Hermite--Hadamard and Ostrowski type integral inequalities are established, which are the generalized variants of the previously known results for harmonically convex functions. Finally, we investigate some applications via this new introduced definition.

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Liver Cancer Classification Using Neural Network–Support Vector Machine with Several Optimizers

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ABSTRACT

Liver is one of the organs that have many important functions. Liver cancer is cancer that arises from the liver and is not a result of malignancy from other organs that spreads to other organs in the body. There are types of classification based on the growth location or metastasis. In the early stages, there are no symptoms for liver cancer indications; however, it can be easily identified by different forms of machine learning methods, such as the Neural Network (NN). This is a popular method with a wide range of applications and known for its high accuracy value, which is a network of a group of small processing units modeled on the nervous system human. Moreover, there is a Support Vector Machine (SVM) with several kernel functions that is commonly used in the classification of diseases and also known for its high accuracy values that the classification algorithm can both for linear and non-linear data. This paper received database of Liver Cancer sufferers, from Dr. Cipto Mangunkusumo Hospital, Indonesia, and it consisted of 122 data with actual amounts of 71 major data and 52 minor data. Therefore, the research is aimed at the performance and accuracy of the combination of NN–SVM as classifier for liver cancer dataset will be compared with several optimizers. Based on findings, Neural Network–Support Vector Machine with Adam Optimizer is the best model for the classification of Liver Cancer with 97.98% accuracy. Therefore, in the future studies, this method can develops to give higher accuracy and uses a larger database, in order to give better results for predicting and classifying different diseases.

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Artificial Neural Networks with Gradient-Based Optimizer and Genetic Algorithm to Classify Small Dataset

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ABSTRACT

Recently, machine learning methods are popularly used in scientific areas, especially with the rise of Neural Network. The Artificial Neural Network (ANN) is a mathematical predictive model that combines numerous processing units and becomes adaptive nonlinear information processing systems. This Network has certain properties including adaptability and the ability to generalize and learn from examples. Because of that, ANN has been applied in many fields such as classification, pattern recognition, time-series prediction, and others. Previous studies have shown that ANN is beneficial to classify the small dataset. Furthermore, a good ANN should be able to minimize errors by using an optimizer algorithm. Therefore, this study discussed Genetic Algorithm (GA) and several gradient-based optimizers including Stochastic Gradient Descent (SGD), RMSprop, Adadelta, AdaGrad, Adamax, and Adam. Subsequently, a comparison was made to determine the small dataset classifier. Meanwhile, the study used the dataset of patients suffering from thalassemia, (genetic blood disorder) in Harapan Kita Children and Women's Hospital, Indonesia. The results showed that ANN with Adam optimizer is the best choice overall with 89.99% in comparison to the gradient-based algorithm. However, Adam compared to GA, GA has higher accuracy than Adam with 93.33%.

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Comparison Between Logistic Regression and Support Vector Machine for Hepatitis Classification

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ABSTRACT

Hepatitis refers to an inflammatory condition of the liver, with symptoms including fatigue, flu-like symptoms, dark urine, yellowing of the eyes and skin. The most common type of hepatitis in the world is Hepatitis B and C. Early diagnosis should be carried out on individuals infected by this virus. Furthermore, they should be properly treated to curb the risks that may occur. Data mining has been useful in helping doctors improve their medical decisions regarding diagnosis of Hepatitis. Some researchers have used several data mining (machine learning) to diagnose Hepatitis. In this study, Logistic Regression and Support Vector Machine were compared to discover which method is best for diagnosing Hepatitis dataset from Tangerang District General Hospital. This dataset consists of 29 Hepatitis B patients and 84 Hepatitis C patients. The target type of this dataset is Hepatitis B or Hepatitis C. In this research, both methods were used and compared because they have some advantages. Logistic Regression provides great training efficiency and easy implementation. The predicted parameters gave a conclusion about the importance of the features. Meanwhile, Support Vector Machine performs well when there is a clear margin of separation between classes and it also has a relatively efficient memory. Based on this experiment, Logistic Regression yielded 96.04% accuracy using 90% of data training, while Support Vector Machine yielded 94.96% accuracy using 70% of data training. Therefore, it can be concluded that Logistic Regression is a better method for classifying Hepatitis dataset.

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Implementing Combined Test Algorithms to Increase Signal Measurement Accuracy

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ABSTRACT

The combined test algorithms increasing the accuracy of measurement by using the simple additive and multiplicative tests have been developed and this enables to determine the measured values of non-electrical quantities by the results of additional test measurements used for identification of nonlinear transformation functions of information measurement systems. The main problem in designing contemporary measuring systems is the increase of quality indices of their metrological characteristics. It is known that this is performed by the following two ways: making renewal in the constructions of initial transformers-technological method, or by not intervening in their construction by the algorithmic-test method. In the present paper, by using the second method, at the expense of extra information obtained by performing additional measuring operations, special test equations are set up and the joint solution of these equations increases the accuracy of measurement of measuring systems.

Some Structures on Pythagorean Fuzzy Soft Topological Spaces

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ABSTRACT

In this paper, along with the investigation of their many attributes, the concept of neighbourhood, connectedness and compactness on pythagorean fuzzy soft topological space have been investigated. Some related theorems have been established as well.

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On the Returned Sequences in the Spectral Problems of Multiple Band Generalized Difference Operator-Matrices

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ABSTRACT

In the work we investigate the behavior of the returned sequences of complex numbers [1]. Then we apply receiving results to some spectral problems for the multiple band generalized difference operator -matrices in some Banach spaces of numerical sequences [2].

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On One Method for Solving the Problem of Parametric Linear Fractional Programming

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ABSTRACT

In this work the problem of linear fractional parametric programming is considered

$$z = \frac{(c'+\lambda c^2)x+e}{(d^1+\lambda d^2)x+f} \to max, 0 \le \lambda \le 1 \quad (1)$$

$$Ix \le Ax + b, \quad x \ge 0 \quad (2)$$

where $x = (x_1, x_2, ..., x_n) \in E^n$, I-is a n order unit matrix, A-is a n order matrix with nonnegative elements, b is an n-dimensional column vector, c^1, c^2, d^1, d^2 are n-dimensional row vectors, e, f are numbers. The following designations are introduced:

$$\left.\begin{aligned} f_1(x) = (c^1 + \lambda c^2)x + e > 0,\ f_2(x) = (d^1 + \lambda d^2)x + f > 0, x \in X, \lambda \in [0;1] \\ Y(\lambda) = \{(f(x,\lambda), f_2(x,\lambda))/\ x \in X\} \end{aligned}\right\} \quad (3)$$

X are the set of feasible solutions. The problem (1) is replaced by the equivalent form:

$$\frac{y_1(\lambda)}{y_2(\lambda)} \to max, y(\lambda) = (y_1(\lambda)y_2(\lambda)) \in Y(\lambda),\ \ 0 \le \lambda \le 1. \quad (4)$$

For each fixed $\lambda_0 \in [0;1]$ this problem is a linear fractional programming problem. Under certain conditions imposed on the matrix A one can show the non negativity of the inverse matrix $(E-A)^{-1} \ge 0$ and the boundedness of the set $Y(\lambda)$.

In this case, the position of the optimal solution $y^*(\lambda_i), i = 0,1,\dots,r$ can be determined on the set $Y(\lambda_0)$ in a different way, the difference of the proposed schemes from those existing earlier is that for the linear programming problem solved at each step [1], the conditions (1) are preserved. Further, for the optimal basis (1) corresponding to $y^*(\lambda_i)$ a set of optimal parameters for a given basis is constructed using the optimality conditions [3].

Thus, the sets of optimal values of the parameter $\Lambda(\lambda_i), i = 0,1,\dots,r$ п covering the interval [0,1] and the corresponding solutions $y^*(\lambda_i), i = 0,1,\dots,r$ jointly represent the solution to the problem (1), (2).

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Piece-Homogeneous Elastic Mediums in the Case When the Binder and Inclusions Are Weaken by the Cohesion Cracks at a Transverse Shear

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ABSTRACT

The problem of the stressed state of a composite weakened by a system of doubly periodic cracks is relevant for various branches of engineering. The formulation of the problem of fissuring substantially extends the original concept of A. Griffiths. Stress intensity factors are the main parameters of fracture mechanics that study the resistance of structural materials to brittle fracture and the predictive performance of machine elements and structures weakened by cracks. The relevance of such studies is caused by the extensive use in the technology of structures and products made of composite materials.

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Solution of Mixed Problem Including A First Order Three Dimensional P.D.E with Nonlocal and Global Boundary Conditions

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ABSTRACT

In this paper solution of mixed complex boundary value problem of first order is considered. The basic term in the problem with respect to space variables, has Cauchy-Riemann operator. We first use Laplace transformation to introduce spectral problem. Then we investigate for corresponding Fredholm's type.

The spectral problem here is different from classical boundary value problems. Here boundary conditions are nonlocal and global and dependent functional to boundary conditions are in general linear.

At the end for the solution of spectral problem which depends on unknown complex parameter, we find asymptotic expansion. With the help of this asymptotic expansion we prove existence and uniqueness of mixed problem.

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On the Matrix Representation of 5 th order Bezier Curve and Derivatives in E^3

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ABSTRACT

Using the matrix representation form, the first, second, and third derivatives of 5th order Bezier curves are examined based on the control points in E^3. Further as a simple way has been given to find the control points of a Bezier curves and its derivatives using matrix product.

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Smarandache Curves of Anti-Salkowskı Curve According to the Spherical Indicatrix Curve of the Unit Darboux Vector

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ABSTRACT

In this paper, we investigate special Smarandache curves with regard to Sabban frame for unit Darboux vector belonging to Anti-Salkowski curve. We created Sabban frame belonging to this curves. It was explained Smarandache curves position vector is consisted by Sabban vectors belonging to this curves. Then, we calculated geodesic curvatures of this Smarandache curves.

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Tangent Associated Curves in E^3

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ABSTRACT

In this paper, we defined tangent associated curves in general. For each associated curves a new frame and the distances between the curves and their mates are given. In particular, it is seen that the involute and successor curves belong to the family of T associated curves. As an application, we present some examples and picture a given curve with its mate together with the corresponding new frame.

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Family of Surfaces with A Common Bertrand D- Isogeodesic and Isoasymptotic Curve

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ABSTRACT

In this paper, we first obtain the necessary and sufficient conditions for a Bertrand D- mate of a given curve of which the curvature is different from zero to be an isogeodesic and isoasymptotic curve in E^3. Second we define ruled surfaces with a common isogeodesic and isoasymptotic Bertrand-D mate and provide the conditions for those to be developable. Finally, we present some examples and picture the corresponding surfaces by Maple v17.

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Generative Adversarial Network for Market Hourly Discrimination

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ABSTRACT

We consider 2 types of instruments traded on the markets, stocks and cryptocurrencies. In particular, stocks are traded in a market subject to opening hours, while cryptocurrencies are traded in a 24-hour market. What we want to demonstrate through the use of a particular type of generative neural network (GAN) is that the instruments of the non-timetable market have a different amount of information, and are therefore more suitable for forecasting. In particular, through the use of real data we will also show that there are stocks following same rules as cryptocurrencies.

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Harmonicity and Differential Equations According to Mean Curvature and Darboux Vectors of Involute Curve

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ABSTRACT

In this paper, we first give some invariants of a differentiable curve. Then we define the involute curve depending on the given curve. After calculating the invariants of involute curve we explain the connections between the main curve and involute curve. We show that it is quite possible to determine some properties of involute curve through the main curve. We refer the formulations obtained previously to clarify the properties that one can make a decision on the given curve using the Darboux vector W and mean curvatures H: In order to reckon the differential equation and type of harmonicity representing involute curve we make use of the curvatures and Frenet elements of main curve. Eventually we take a differentiable curve and count up the curvatures and Darboux vector of the curve. In this way we look at how the given statements come true.

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Analyzing Cerebral Infarction Data to Detect Ischemic Stroke with Ensemble Learning Approach

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ABSTRACT

Stroke is the second deadliest disease in the world that occurs when blood supply to the brain is disrupted or reduced due to blockage or rupture of a blood vessel. There are two types of stroke, namely hemorrhagic and ischemic stroke. Ischemic stroke is the most common type in Indonesia and accounts for about 52.9% of all stroke cases. Infarction often occurs in ischemic stroke because of insufficient supply of oxygen and nutrients to the brain. This is due to the disruption of blood flow to the brain. The detection of cerebral infarction assists the health sector in diagnosing ischemic stroke. The data used in this study were obtained from the Department of Radiology, Dr. Cipto Mangunkusumo Hospital, Jakarta, Indonesia which consisted of 206 samples and 7 features. The features of the data were obtained from descriptions of brain imaging CT Scans. To analyze cerebral infarction data, two ensemble learning methods were compared. They include Random Forest (RF) and Extreme Gradient Boosting (XGBoost). In terms of accuracy performance, the average accuracy of Random Forest was slightly higher than the average accuracy of XGBoost. However, the highest average accuracy produced by both methods was 95.238% on 90% of training data. In terms of running time computation performance, XGBoost was 10 times faster than RF. Using 90% of training data, XGBoost and RF required 2.023 and 21.743 seconds of running time computation, respectively. Thus, in analyzing cerebral infarction data, Random Forest produced higher accuracy performance, while XGBoost was faster in running time computation performance.

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Comparison of Kernels Function on Twin Support Vector Machines for Lung Cancer Classification

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ABSTRACT

Machine learning technology is needed in the medical field. Therefore, this research is useful for solving problems in the medical field by using machine learning. Many cases of lung cancer are diagnosed late. Early detection of lung cancer is the most promising way to enhance a patient's chance for survival. Machine learning is an approach that is part of artificial intelligence and can detect colorectal cancer early. Twin support vector machines aims to find two hyperplanes such that each plane has a distance close to one data class and as far as possible from another data class. This study discusses lung cancer classification using twin support vector machines method based on kernel function. Twin support vector machines is fast in building a model and has good generalizations. However, twin support vector machines requires kernel functions to operate in the feature space. The kernel functions commonly used are the linear kernel, polynomial kernel, radial basis function (RBF) kernel, and gaussian kernel. This paper uses the twin support vector machines method with these kernels and compares the best kernel for use by twin support vector machines to classify lung cancer dataset. Our work will be performed on the lung cancer CT Scan dataset obtained by the Cipto Mangunkusumo Hospital, Indonesia. It consists of benign cases 69 and malignant cases 69 samples. However, the best kernel obtained is the RBF kernel, which produces an accuracy of 100%, a precision of 100%, a recall of 100%, f1-score of 100% and a running time of around 0.31 s.

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Comparison of the accuracy of Support Vector Machines and Naive Bayes in Neuroblastoma Classification

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ABSTRACT

Neuroblastoma is a rare type of cancer that develops from neuroblast or immature nerve cells in children. As one of childhood cancer, the neuroblast that should grow and function as nerve cells forms a lump in a solid tumor. In general, cancer in children is almost impossible to prevent. So the most effective strategy for predicting cancer in children is to focus on early diagnosis and effective therapy. To resolve these problems, the research field requires new preclinical models, technologies, and concepts. Accuracy comparison among Support Vector Machines(SVM) and Naive Bayes to diagnose neuroblastoma in children make a better prediction. SVM is a classification method that can separate two classes from a given sample with a maximum margin, which has proven to offer the best generalizability. Generalizability refers to the fact that classifiers have good classification performance called accuracy on the training data and ensure high predictive accuracy for future data from the same distribution as the training data. Naive Bayes Classification is a classification method based on Bayes Theorem that has fundamental assumption independent among the features. Naive Bayes is sourced on Baye's Theorem and specifically suited when the dimensionality of input is immense. Bayes theorem is a predictive technique based on simple probabilities, based on the application of Bayes' rule with possibility independence or strong independence, which is called naivety. It makes simple probability because the presence of one particular feature does not affect the other.

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Estimates of Mean Type Fractional Inequalities For Differentiable Functions

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ABSTRACT

In this article, we established a wide range of fractional mean-type integral inequalities for notable Hilfer fractional derivative using twice differentiable convex and s-convex functions for $s \in (0,1]$ with related identities. Also the results for Caputo fractional derivatives are derived as a special case of our general results.

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Detection Hematoma Expansion in Intracerebral Hemorrhage Using Support Vector Machine Based on Genetic Algorithm Feature Selection

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ABSTRACT

Hemorrhagic stroke is a stroke caused by disruption of brain function due to sudden bleeding that can occur in the brain or its surroundings. The most common hemorrhagic stroke type is intracerebral hemorrhagic(ICH); this type of stroke has a very high mortality rate. However, one promising strategy in treating ICH is predicting hematoma expansion through data on CT scanning. With these detection results, the medical team can determine effective prevention or treatment strategies for ICH patients. However, in general, the data on a patient's CT scan can have many features. Not all features we will use because not all features are informative; it can reduce the classification performance and the classification results' accuracy. So it is necessary to select features on the data used in the process of detecting hematoma expansion. In this context, classification algorithms can help see hematoma expansion through patterned CT scan data in patients with ICH. This study proposes to use the Support Vector Machines (SVM) method as a classification algorithm. We use SVM with Polynomial kernel and SVM with Radial Basis Function (RBF) kernel. Then, to obtain informative features to improve the classification method's accuracy, feature selection will be carried out using a genetic algorithm. Comparing the results between regular SVM and SVM with a genetic algorithm was performed, which was evaluated based on sensitivity, specificity, and accuracy. From the experimental results, using feature selection can optimize detection and improve method accuracy.

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On Multivariable Matrix Spectral Factorization

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ABSTRACT

Wiener and Masani [2] proved the existence of matrix spectral factorization

$$S(t) = S_+(t)S_+^*(t)$$

for spectral density functions S defined on the unit circle T in the complex plane. Their theorem has been extended to multivariable case by Helson and Lowdenslager [1], where S is defined on the n-dimensional torus T^n. In the multivariate situation, analyticity of the factor S_+ is defined with respect to the half-plane of lattice points $H_n \subset Z^n$. In our talk, we will demonstrate that in the special important case where H_n produces the standard lexicographic order in Z^n, the Helson- Lowdenslager theorem can be derived from Wiener-Masani theorem. Certain explicit forms of multivariable matrix spectral factorization will be presented.

ACKNOWLEDGEMENT
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Fekete-Szegö Problem for A Subclass of Analytic Functions Defined By Chebyshev Polynomials

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ABSTRACT

We obtain initial coefficients $|a_2|$ and $|a_3|$ for a certain subclass of analytic functions by means of Chebyshev polynomials expansions in D. Then, we solve Fekete-Szegö problem for functions in this subclass.

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Integral Operators Involving q - Poisson Distribution Series

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ABSTRACT

The q - derivative operator has been used to investigate several subclasses of analytic functions in different ways with different perspectives by many researchers and their interesting results are too voluminous to discuss. For example, the extension of the theory of univalent functions can be used to describe the theory of q - derivative. Also, q - derivative operator are also used to construct several subclasses of analytic functions and so on.

In this study, we introduce and investigate certain subclasses of analytic and univalent functions defined by q - derivative and for $q \in (0,1)$ we define two analytic functions expressed with q - Poisson Distribution Series and integral operators involving Poisson Distribution Series as follows

$$F_q(p,z) = z + \sum_{n=2}^{\infty} \frac{p^{n-1} e_q^{-p}}{[n-1]_q!} z^n \text{ and } G_q(p,z) = 2z - F_q(p,z),$$

$$\hat{F}_q(p,z) = \int_0^z \frac{F_q(p,t)}{t} dt \text{ and } \hat{G}_q(p,z) = \int_0^z \frac{G_q(p,t)}{t} dt, \ z \in U,$$

respectively.

Our main purpose in this study is to find the conditions for the two operators $\hat{F}_q$ and $\hat{G}_q$ defined above to belong to the analytic function classes defined in the study.

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On Copies of c_0 and ℓ^1 and Failure of Fixed Point Property

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ABSTRACT

James' Distortion theorems played a vital role to investigate Banach spaces containing nice copies of c_0 or ℓ^1 and their failure of the fixed point property for nonexpansive mappings. His tools leaded researchers to see that every classical nonreflexive Banach space contains an isomorphic copy of either c_0 or ℓ^1. There have been many researches done using these tools developed by James and followed by Dowling, Lennard and Turett mainly to see if a Banach space can be renormed to have the fixed point property for nonexpansive mappings when there is failure. Recently, in a study in preparation, the first author joined with his student Güven obtained alternative asymptotically isometric properties implying failure of the fixed point property inside copies of c_0 or ℓ^1. Inspired by their study, we investigate James' results and find relations with some new properties originated from their alternative asymptotically isometric properties. Then, we show that we get some properties that are equivalent for Banach spaces to have isomorphic copies of c_0 or ℓ^1. So we obtain some results that imply failure of fixed point property besides nonreflexivity.

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Partial Sums of the Bessel-Struve Kernel Function

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ABSTRACT

Let $\left(B_\nu\right)_n(z)=z+\sum_{m=1}^{n}b_m z^{m+1}$ be the sequence of partial sums of normalized Bessel-Struve kernel function $B_\nu(z)=z+\sum_{m=1}^{\infty}b_m z^{m+1}$. The purpose of the present paper is to determine lower bounds for $\Re\left\{\frac{B_\nu(z)}{\left(B_\nu\right)_n(z)}\right\}$, $\Re\left\{\frac{\left(B_\nu\right)_n(z)}{B_\nu(z)}\right\}$, $\Re\left\{\frac{B_\nu'(z)}{\left(B_\nu\right)_n'(z)}\right\}$ and $\Re\left\{\frac{\left(B_\nu\right)_n'(z)}{B_\nu'(z)}\right\}$.

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On Subclasses of Analytic Functions Defined by q - Derivative and their Some Geometric Properties

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ABSTRACT

Recently, the q - derivative operator has been used to investigate several subclasses of analytic functions in different ways with different perspectives by many researchers and their interesting results are too voluminous to discuss. For example, the extension of the theory of univalent functions can be used to describe the theory of q - derivative. Also, q - derivative operator are also used to construct several subclasses of analytic functions and so on.

In this study, we introduce certain subclasses of analytic and univalent functions defined by q - derivative. Here, we give some conditions for an analytic and univalent function to belong to these defined classes.

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Partial Sums of Generalized Dini Functions

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ABSTRACT

In the present investigation our main aim is to give lower bounds for the ratio of generalized Dini functions and their sequences of partial sums.

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Approximate Solutions for Different Types of Fractional Heat Equation

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ABSTRACT

In this paper, we are interested in obtaining approximate solution of the fractional heat equation where the fractional derivative is in Caputo's sense. We also consider the heat equation with heat source and heat loss. The fractional Laplace-Adomian decomposition method is utilized to gain the approximate solutions of these equations. We give the graphical representations of the solutions depending on the order of fractional derivative.

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Fourier Methods for Determination of an Unknown Heat Source of Poly(methyl methacrylate) (PMMA) with Periodic Boundary Conditions

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ABSTRACT

In this paper, we consider a coefficient problem of an inverse problem of a quasilinear parabolic equation with periodic boundary and integral over determination conditions. We prove the existence, uniqueness and continuously dependence upon the data of the solution by iteration method.

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Half Inverse Problems for the Impulse Quadratic Pencil with the Discontinuouty Coeficient

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ABSTRACT

In this paper, we consider the inverse spectral problem for the impulsive Sturm-Liouville differential pencils on $[0,\pi]$ with the Robin boundary conditions and the jump conditions at the point $\frac{\pi}{2}$. We prove that two potentials functious on the whole interval and the parameters in the boundary and jump conditions can be determined from a set of eigenvalues for two cases: (i) The potentials is given on $\left(0,\frac{\pi}{4}(1+\alpha)\right)$. (ii) The potentials is given on $\left(\frac{\pi}{4}(1+\alpha),\pi\right)$, where $0<\alpha<1$, respectively.

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Mathematical Modeling of the Effect of Laser Scan Speed on Size of Texture Created on Polyvinyl Chloride (PVC) Plate

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ABSTRACT

The objective of this study is to determine the mathematical model to apply the effect of the laser scan speed on groove size that is created on polyvinyl chloride (PVC). Polyvinyl chloride (PVC) which is a polymer is widely used in several industrial segments [1]. Polyvinyl chloride (PVC) plates can be used as a dust collecting material of WMESP with its good chemical stability, high strength, high corrosion and ageing resistance, insulation performance, and smooth surface [2].

When the scan speed is increased, the interaction time between the laser beam and the material decreases. In this mathematical model obtained, the change to groove size depending on the laser scan speed is modeled. To validate the mathematical model, the surfaces of the PVC plate with 4.5 mm thickness were ablated with different scan speed at constant power. Since the CO_2 lasers are more widely used in the industry, the CO_2 laser that has 10600 nm wavelengths and 130 Watts maximum power was used in the ablation. The images of ablated PVC surfaces were taken with a Leica stereo microscope. Size measurements were made from top view images obtained with optical microscope.

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BCI-Ordering and Zero-Divisor Graphs of BCK-Algebras

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ABSTRACT

BCK and BCI-algebras are the classes of abstract algebras which were introduced by Imai and Iseki. The zero-divisor graph of a commutative ring R was introduced by Beck. Zero-divisor graphs of partially ordered sets and lattices are well-studied in many papers. Let X be a BCI/BCK-algebra and $(X, \leq)$ be BCI-ordering. The zero-divisor graph of BCI/BCK-algebras was well-studied graphs. In this study, we investigate zero-divisor graphs on BCK-algebras for non-zero elements. We give results about its combinatorial properties such as diameter, girth and connectivity.

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On Uniformly 1-Absorbing Primary Ideals

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ABSTRACT

In this article, we introduce the concept of uniformly 1-absorbing primary ideal which is a generalization of uniformly primary ideal. Let R be acommutative ring with a unity and P be a proper ideal of R. P is said to be a uniformly 1-absorbing primary ideal if there exists $n \in \mathbb{N}$ and whenever $xyz \epsilon P$ for some nonunits $x, y, z \in R$ then either $xy \in P$ or $z^n \in P$. The smallest afforementioned $n \in \mathbb{N}$ is called the order of P and denoted by $\mathrm{ord}(P) = n$. In addition to give many properties of uniformly 1-absorbing primary ideals, we investigate the relations between uniformly 1-absorbing primary ideals and other classical ideals such as uniformly primary ideals, 1-absorbing primary ideals, uniformly 2-absorbing primary ideals

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Conformal Generic Riemannian Maps

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ABSTRACT

In this study, as a generalization of conformal semi-invariant Riemannian maps, we introduce the notion of conformal generic Riemannian maps from an almost Hermitian manifold onto a Riemannian manifold. Also, we give examples for conformal generic Riemannian maps. The geometry of foliations are examined by using the concept of pluriharmonic maps on the total manifold and the base manifold. For this type maps, some conditions to be horizontally homothetic map are researched. Lastly, necessary and sufficient conditions to be totally geodesic map for such foliations are introduced.

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On Sheffer Stroke L-Algebras

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ABSTRACT

In this paper, we introduce a new algebraic and logical structure which is called “Sheffer stroke L-algebras”. We give definitions of Sheffer stroke L-algebras, a subalgebra and a normal subset of a Sheffer stroke L-algebras. Filter and ultrafilter of Sheffer stroke L-algebras are determined. A homomorphism between Sheffer stroke L-algebras is introduced and isomorphism theorems are proved.

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Hardy-Type Inequalities via Diamond Integrals for Function of Several Variables

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ABSTRACT

We establish some Hardy-type inequalities with general kernels are generalized to arbitrary time scales via diamond integrals for function of several variables. Some classical and new inequalities are deduced for special kernels and special time scales.

Monotonicity of A Ratio Involving Trigamma and Tetragamma Functions

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ABSTRACT

In the paper, by convolution theorem of the Laplace transforms, Bernstein's theorem for completely monotonic functions, and logarithmic concavity of a function involving exponential functions, the author
(1) finds necessary and sufficient conditions for a ratio involving trigamma and tetragamma functions to be monotonic on the right real semi-axis;
(2) and presents alternative proofs of necessary and sufficient conditions for a function and its negativity involving trigamma and tetragamma functions to be completely monotonic on the positive semi-axis.
These results generalizes known conclusions recently obtained by the author.

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Sharp Inequalities of Generalized Hersch-Pfluger Distortion Function and Belinskii Function

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ABSTRACT

In this talk, the authors present some distortion properties of the generalized Belinskii function and establish the maximal value of of generalized Hersch-Pfluger distortion function. By applying these results, new bounds of the solutions of Ramanujan's generalized modular equation are obtained.

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Construction of q-Difference Equations from The Perspective of q-Polynomials

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ABSTRACT

In this talk, we show how to construct q-difference equations from the perspective of q-polynomials and prove identities and evaluate integrals by expanding functions in terms of products of the q-polynomials by q-difference equations, we also generalize some results of M.E.H. Ismail, Rui-Ming Zhang and Zhi-Guo Liu. In addition, we generalize multilinear and multiple generating functions for the q-polynomials as applications. Moreover, we deduce some recurring formulas for Ramanujan integrals, Askey--Roy integrals and Andrews--Askey integrals by the solutions of q-difference equations. At last, we generalize some iterated fractional q-integrals and build the relations of fractional q-integrals and q-Mittag-Leffler function.

f-Lacunary Almost Statistical Convergence and f-Lacunary Almost Summability of Double Sequences of Order α for Fuzzy Numbers

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ABSTRACT

In this study we introduce the concept of f- lacunary almost statistical convergence and f-lacunary almost summability of double sequences of order α for fuzzy numbers. We give some inclusion relations between these concepts.

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$\mathcal{I}$-Convergent Functions Defined on Amenable Semigroups

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ABSTRACT

In this paper, we introduce and study the concepts of $\mathcal{I}$-convergence, $\mathcal{I}^*$-convergence, $\mathcal{I}$-Cauchy sequence and $\mathcal{I}^*$-Cauchy sequence of functions defined on discrete countable amenable groups, where $\mathcal{I}$ is an ideal of subsets of the amenable semigroup G.

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An Application on Interior and Closure in General Topology: A Key Agreement Scheme

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ABSTRACT

We present a key agreement protocol based on the notions of interior and closure well known in general topology.

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The Hosoya Polynomial of the Schreier Graphs of the Grigorchuk Group and the Basilica Group

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ABSTRACT

The Grigorchuk group was first introduced by R. Grigorchuk in 1980. Also the Basilica group was introduced in 2002 by R. Grigorchuk and A. Zuk. In the following years, it was shown that these groups have deep connections with profinite group theory and complex dynamics. These groups have been proven to provide the self-similarity property, reflecting the fractalness of some limit objects associated with them. The Schreier graph codifies the intangible structure of a group. It establishes an equivalence relationship created by cosets. The Schreier graphs of the Grigorchuck group and the Basilica group are a combination of loops arranged in a tree-like form due to the recursive expression of the generators of these groups. The Tutte polynomial of these graphs was calculated in 2010, see [3]. In this work, we study the Hosoya polynomial of these graphs and try to characterize them.

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The Metric Topologies on Vertices Sets of the Connected Undirected Graphs

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ABSTRACT

Recently, graph theory has been used effectively in solving of some problems in many fields. As a result of this, the theory is very important for many fields. Recently, various topologies have been generated from graphs by different methods by some researchers. In this paper, a metric on vertices set of a simple undirected graph is defined. The vertice-centered metric topology on vertices set of the graph is defined by using this metric. It is studied that some properties of this topology.

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Dense Sets in Pythagorean Fuzzy Soft Topological Spaces

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ABSTRACT

In this paper, several different types of dense sets such as nowhere dense sets and somewhere dense sets have been investigated in pythagorean fuzzy soft topological spaces and some basic characteristics of these notions are provided. The interrelationships between the different concepts were also analyzed in depth.

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The Laplace Transform of Distribuiıon Functions of A Semi-Markovian Random Walk Process With Positive Tendency and Negative Jumps

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ABSTRACT

One of the important problems of stochastic process theory is to define the Laplace transformations for the distribution of this process. With this purpose, we will investigate a semi-markovian random walk process with positive tendency and negative jumps in this article. The first falling moment to a certain level of this process is constructed as mathematically and the Laplace transform of this random variable is obtained.

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A Graph Alteration on Disjunctive Total Domination

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ABSTRACT

Some various problems of domination number concentrate on graph alterations and their effects on the domination number. Some graph alterations are deleting a vertex or an edge, adding an edge and subdividing an edge [1, 2, 3]. There are many variations of domination, one of which is disjunctive total domination [4]. A set S of vertices in a graph G is a disjunctive total dominating set of G if every vertex is adjacent to a vertex of S or has at least two vertices in S at distance two from it. The disjunctive total domination number is the minimum cardinality of such a set. In this work, we focus on a graph alteration on disjunctive total domination and we examine its effect on some graphs.

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Oscillatory Behaviors of Singular Integrodifferential Equations

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ABSTRACT

Singular perturbation theory has a vast literature with a wide variety of applications, for example, see [1-6]. A range of complicated techniques has been developed in recent years and they have been applied to many problems in many diverse fields. In this work, we study the oscillatory behaviors of the solutions for singular integrodifferential equations [7,8] from which we obtain the suppressed small exponentials that may become the dominant contributions of the equations via asymptotic analysis. In doing the analysis, we demonstrate where the suppressed exponentials of the integrodifferential equations behave with oscillations and where they do not behave with oscillations.

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The Graph of a Special Subgroup of the Modular Group

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ABSTRACT

We establish suborbital graph of $\Lambda_n(N)$ in the $\widehat{\mathbb{Q}}_n(N)$. And we obtain conditions of edge and triangle in the suborbital graph $F_{u,n,N}$. Then, we have the some results when the state of 2nd and 3rd order element in the $\Lambda_n(N)$. And then, we investigate the suborbital graph $F_{u,n,N}$ of the some properties of teorical and application. Moreover, we prove that the suborbital graph of $\Lambda_p(N)$ in the $\widehat{\mathbb{Q}}_p(N)$ is a forest for $p|N,\ p \in \mathbb{P},\ p \geq 5$.
Here,

$$\Gamma = \mathrm{PSL}(2,\mathbb{Z}),$$
$$\Gamma_0(N) = \{\begin{pmatrix} a & b \\ cN & d \end{pmatrix} \in \Gamma:\ c \equiv 0\ mod\ N, N \in \mathbb{Z}^+\},$$
$$\Lambda_n(N) = \{\begin{pmatrix} a & b \\ cN & d \end{pmatrix} \in \Gamma_0(N): a^4 \equiv 1\ mod\ n\ \ or\ a^2 \equiv d^2\ mod\ n\}\ n, N \in \mathbb{Z}^+, n|N,$$
$$\widehat{\mathbb{Q}}_n(N) = \{\frac{a}{cN} \in \widehat{\mathbb{Q}} = \mathbb{Q} \cup \{\infty\}: a^4 \equiv 1\ mod\ n\ \ and\ \ (a, cN) = 1\}\ n, N \in \mathbb{Z}^+, n|N.$$

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Compliance Performances of Some Growth Models When They Have Linear and Quadratic Oblique Asymptotes

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ABSTRACT

In this study, four well-known growth models with an upper horizontal were turned into the growth models with the upper linear and quadratic oblique asymptotes. To obtain the modified growth models with the linear and quadratic oblique asymptotes, instead of the upper horizontal parameter of the growth models, the linear increasing function ($l(t)=mt+n$; $m, n\geq 0$) and the quadratic increasing function ($q(t)=pt^2+mt+n$; $p, m, n\ n\geq 0$) were used in the modified growth models, respectively. The model parameters were calculated and the models' performances were compared using the following goodness of fit criteria: Coefficient of Determination (R^2), Adjusted Coefficient of Determination (R^2_{adj}), Mean Square Error (MSE), Akaike Information Criteria (AIC). As a result, it was observed that the models with the linear and quadratic oblique asymptotes were quite better than the models with classical horizontal asymptote in terms of the goodness-of-fit criterias used. Even quadratic oblique asymptotes were quite better than the models with the linear oblique asymptotes in terms of the goodness-of-fit criterias used.

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The Role of Delay Driven Hopf Bifurcations in A Prey-Predator Type One-Dimensional Mathematical Model of Non-Diffusive Plankton Interactions

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ABSTRACT

Marine ecosystem has very complex dynamics with many non-linearly interacting species from micro-scale to macro-scale, and thus numerous mathematical work has been performed and is still required to approximate its complex dynamics. In order to develop mathematically attainable models, most of the research in theoretical ecology have been conducted on simple spatial and temporal models of prey-predator interactions and their potential outcomes; zooplankton and phytoplankton interactions in particular [1,2]. In this presentation, a mathematical model of oxygen itself and phytoplankton as its producer and zooplankton, introduced in [3], is taken into consideration. Main objective is to mathematically analyze the dynamical system of these species and discuss how a constant time delay in the zooplankton maturation affects their interactions. The local stability and delay induced Hopf bifurcation analysis around the positive equilibria of the system is also examined. Various numerical simulations are performed to support the theoretical results.

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New General Variants of Chebyshev Type Inequalities via Generalized Fractional Integral Operators

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ABSTRACT

In this paper, we have proved some new integral inequalities via generalized proportional fractional integral operators for integrable functions. We have obtained some more general estimations by using the expansion of exponential function.

Grüss Type Inequalities via Generalized Fractional Operators

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ABSTRACT

Fractional calculus is very attractive tool to explain the real world problems in applied sciences, physics and mathematical biology. New fractional integral and derivatives give us opportunity to provide new approaches to certain problems in the theory of inequalities. In this paper, we have used the generalized proportional fractional integral operators to prove some new extensions for Grüss type inequalities.

(m,n)-Harmonically Polynomial Convex Functions and Some Hadamard Type Inequalities on the Co-ordinates

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ABSTRACT

In this study, we have introduced a new concept called (m,n)- harmonically polynomial convex functions on the co-ordinates. Then, we have demonstrated some properties of this definition. Based on the definition and some elemantery analysis process, we have proved a new Hadamard type integral inequality on the coordinates for (m,n)- harmonically polynomial convex functions. Finally, we have established Hadamard type inequality for differentiable (m,n)-Harmonically polynomial convex functions. We have also given some special cases for bounded functions.

Non-Conformable Fractional Integral Inequalities of Chebyshev-Polya-Szegö Type

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ABSTRACT

Advances in the field of fractional analysis have made the journey towards new horizons in mathematics and applied sciences in recent years. On the basis of new integral and derivative operators, many applied mathematics, modeling, numerical analysis and mathematical biology problems have been reconsidered and resolved. Inequality theory has taken its share from these new horizons and recently, inequality studies involving fractional integrals and derivatives have been carried out recently. In this article designed in this direction, the results were obtained by using the non-conformable fractional integral operator on new inequalities of Polya-Szegö and Chebyshev type.

Some Integral Type Inequalities for n-Polynomial s-Type p-Convex Functions and Applications

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ABSTRACT

In this work, we define and introduce the idea of n-polynomial s-type p-convex functions. We elaborate the newly introduced idea by examples and some interesting algebraic properties. As a result, new Hermite--Hadamard, some refinements of Hermite--Hadamard and Ostrowski type integral inequalities using hypergeometric functions regarding newly introduced idea are established. Finally, we investigate some applications. These new results yield us some generalizations of the prior results and also may inspire and motivate for further research in this direction furthermore.

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Generalized Conformable Fractional Operators

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ABSTRACT

In 2015, Abdeljawad has put an open problem, which is stated as: ‘‘Is it hard to fractionalize the conformable fractional calculus, either by iterating the conformable fractional derivative (Grunwald-Letnikov approach) or by iterating the conformable fractional integral of order $0 < \alpha \leq 1$ (Riemann approach)? Notice that when $\alpha = 0$ we obtain Hadamard type fractional integrals’’. In this article we claim that yes it is possible to iterate the conformable fractional integral of order $0 < \alpha \leq 1$ (Riemann approach), such that when $\alpha = 0$ we obtain Hadamard fractional integrals. First of all we prove Cauchy integral formula for repeated conformable fractional integral and proceed to define new generalized conformable fractional integral and derivative operators (left and right sided). We also prove some basic properties which are satisfied by these operators. These operators (integral and derivative) are the generalizations of Katugampola operators, Riemann-Liouville fractional operators, Hadamard fractional operators. We apply our results to a simple function. Also we consider a nonlinear fractional differential equation using this new formulation. We show that this equation is equivalent to a Volterra integral equation and demonstrate the existence and uniqueness of solution to the nonlinear problem. At the end, we give conclusion and point out an open problem.

Some Weighted Generalizations of Hermite-Hadamard Type Inclusions for Products of Co-ordinated Convex Interval-Valued Functions

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ABSTRACT

In this work, we obtain some generalized Hermite-Hadamard-Fejér type inclusions for the product of two co-ordinated convex interval-valued functions. These inclusions are generalizations of some results given in earlier works.

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Inequalities for Quasi-Convex Functions via Generalized Riemann-Liouville Fractional Integrals

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ABSTRACT

We establish some new Hermite-Hadamard-type inequalities involving generalized fractional integrals for quasi-convex functions. Other integral inequalities for two functions are obtained as well. The analysis used in the proofs is fairly elementary and based on the use of Hölder inequality.

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The Alpha Power Weibull Frechet Distribution: Properties and Applications

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ABSTRACT

Modeling everyday life processes play a great role in human existence. Thus, distribution theory has helped to understand how our everyday life processes are distributed. However, this depends on how researchers in distribution theory compound several distributions to derive a more flexible distribution. This study proposes the alpha power Weibull Frechet distribution for real-life datasets. However, some statistical structural properties of the model such as kurtosis, hazard rate and odd functions, cumulative, quantiles, reversed hazard, skewness, order statistics and survival function were derived. The parameters of the proposed model were obtained using the maximum likelihood method. The behavioural nature of the model was studied through simulation. Finally, a two real life data was used to investigate the performance of the proposed model. The results show that the new model performs better than some existing continuous models in statistical literature.

Some Inequalities of Grüss Type for A Weighted Fractional Integral Operator

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ABSTRACT

Studies on fractional calculus is growing rapidly in recent years. However, the application areas of the findings are increasing day by day. In order to contribute to this field, in this study, new lemma and theorems are obtained with the weighted fractional integrals of a function with respect to another function.

Inequalities for Geometrically Convex Functions

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ABSTRACT

In the present paper, we have recalled some de…nitions and well known results for the …eld of inequality theory. Then, some new integral inequalities have been established for geometrically convex functions via some well-known inequalities such that Young and Hölder inequality. Our results involve new upper bounds for product of geometrically convex functions that have applications in different branches of mathematics with statictics and convex analysis.

Numerical Simulation of Mathematical Model of Tumor Growth

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ABSTRACT

In this presentation, I will present a numerical simulation of reaction diffusion model that describe the tumor invasion due to acidity. The model explains the special distribution and temporal growth of tumor cells, normal cells and concentration of hydrogen ions i.e. H^+ ions. In this work I assume that tumor cells are growth in this acidity environment for some specific value of concentration H^+ ions and normal cells died in this environment. I will extend the model of Gatenby et al., [1].The work I do to solve this problem which helps us to design a new and better experiments or cure.

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Investment Affect on Gross Domestic Product of Azerbaijan

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ABSTRACT

In this work, was created the econometric model that demonstrates the dependence of GDP on investments in case of Azerbaijan economy. This approach provides an opportunity for strategic planning of GDP for the country. In this work, to achieve the desired level of GDP for current year, the volume of investment for previous year is used as the independent variable in the dynamic model. But as indicated above, many other factors affect GDP. We chose one of them: the amount of investment Further research will be created the dynamic model of GDP for current year depending on investment volume of previous year. In this case, a dynamic model will allow to plan GDP volume depending on investment volume of previous year. This aproach is very important from point of GDP planning view.

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A Tauberian Theorem for the Deferred Cesàro Mean Method of Summability

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ABSTRACT

Assume (p_n) and (q_n) are sequences of nonnegative integers and $\lim q_n = +\infty$. The deferred Cesàro means of a real or complex sequence (x_n) are given by the sequence $(D_n^{p,q})$ as in the following:

$$D_n^{p,q} = \frac{1}{q_n - p_n} \sum_{k=p_n+1}^{q_n} x_k \text{ for } n = 1, 2, \ldots.$$

We determine conditions such that

$$\lim D_n^{p,q} = \mu \text{ implies } \lim x_n = \mu,$$

where μ is a finite number. These conditions are one-sided or two-sided when the x_n are real or complex numbers, respectively.

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The Radii of $\alpha-$Convexity of the Function $az^2J_\nu''(z)+bzJ_\nu'(z)+cJ_\nu(z)$

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ABSTRACT

In this paper our aim is to determine the radii of $\alpha-$Convexity for three different kind of normalization of the function $N_\nu(z)=az^2J_\nu''(z)+bzJ_\nu'(z)+cJ_\nu(z)$, where $J_\nu(z)$ is the Bessel function of the first kind of order ν. The key tools in the proof of our main results are the Mittag-Leffler expansion for function $N_\nu(z)$, properties of zeros of the function $N_\nu(z)$ and some inequalities for complex and real numbers.

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Yet Some Other Alternative Asymptotically Isometric Properties Inside Copies of ℓ^1 and Their Implication of Failure of Fixed Point Property

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ABSTRACT

James' Distortion theorems played a vital role to investigate Banach spaces containing nice copies of c_0 or ℓ^1 and their failure of the fixed point property for nonexpansive mappings. His tools leaded researchers to see that every classical nonreflexive Banach space contains an isomorphic copy of either c_0 or ℓ^1. There have been many researches done using these tools developed by James and followed by Dowling, Lennard and Turett mainly to see if a Banach space can be renormed to have the fixed point property for nonexpansive mappings when there is failure. Recently, in a study in preparation, the first and the third authors obtained alternative asymptotically isometric properties implying failure of the fixed point property inside copies of c_0 or ℓ^1. In this study, we provide more alternative asymptotically isometric properties in copies of ℓ^1. Analogously, we introduce a new property equivalent for a Banach space to contain asymptotically isometric copy of ℓ^1. That is, we show that a Banach space contains an asymptotically isometric copy of ℓ^1 if and only if it has the property we introduce.

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Finite Element Scheme for the Semi-Linear Wave Equation with Scale-Invariant Damping, Mass and Power Non-Linearity in Two Dimension

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ABSTRACT

In this work, we focus on the numerical investigation of the semi-linear scale-invariant wave equation with damping, mass and power non-linearity in two dimensions. We propose the hybrid numerical scheme which is consist of finite difference and finite element methods to acquire the numerical solution of aforementioned initial value problem. In the solution procedure we have been used the finite difference method(FDM) for discretization of the temporal variable. We have also considered the finite element method(FEM) to discretize the spatial variable. The obtained Bubble-like numerical solutions of aforesaid initial value problem by using FDM/FEM hybrid numerical scheme displayed by graphics at different time steps.

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Investigating the Relationship between Attitudes of Secondary School Mathematics Teachers' Towards Technology and Their Self-Confidence in Technological Pedagogical Content Knowledge

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ABSTRACT

The purpose of this study is to determine the relation between Attitudes of Secondary School Mathematics Teachers' Towards Technology (ATT) and Their Self-Confidence in Technological Pedagogical Content Knowledge (TPACK). Participants of this study are 57 mathematics teachers from 22 different high schools. The Scale of Attitudes towards Technology Developed by [1], TPACK Confidence Survey Developed by [2] and adapted to Turkish by [3] was used in this research as data collection tools. Simple Correlation and Simple Linear Regression Analyze methods were used to analyze the data. In the examination, it was understood that there is a moderate, positive and significant relationship between the teachers' ATTs and their TPACK Self-Confidence ($R=.393$, $p<.01$). In addition, it was found that the teachers' ATTs were a significant predictor of their TPACK Self-confidence ($R=.393$, $R2=.154$, $F(1, 55)=10.043$, $p<.01$) and 15% of the total variance of the TPACK Confidence Survey can be explained by the Scale of ATT. As a result of the analysis, the simple regression equation for predicting the TPACK Self-confidence of mathematics teachers was determined as " TPACK Self-Confidence = 1.082 + 0.589*ATT ".

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New Exact Solutions for Conformable Time Fractional Equation System via IBSEFM

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ABSTRACT

The fractional differential equations are widely applied in physical fields such as optics, fluid mechanics, plasma physics, solid state physics. Several of techniques have been applied to reach the exact solutions of these equations.

The object of the present paper is to construct new exact solutions of conformable time fractional equation system by using the Improved Bernoulli Sub-Equation Function. Method (IBSEFM). Applying this proposed method, we get the exact solutions of this equation system that we consider. According to the obtained solutions, we plot the 2D and 3D graphs under the suitable values by the aid of mathematics software.

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Some Properties of Codazzi Couplings

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ABSTRACT

In this study, we investigate properties of Codazzi couplings on an $2n$ dimensional almost Norden manifold M equipped with an almost paracomplex structure J, a pseudo-Riemannian metric g, a linear connection ∇ and the twin metric $G = g \circ J$.

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